<u>CLAIMS</u>

1. Imaging method for nuclear magnetic resonance, wherein a constant static magnetic field acts upon a sample, wherein an additional field is superimposed on the static magnetic field, the additional field having, in at least one grating surface within the sample volume, different field strength values at each point of the grating surface, wherein the sample is excited by a high-frequency electromagnetic alternating field, and wherein the electromagnetic radiation emitted from the excited sample is read out and evaluated for generating images.

2. Imaging method for nuclear magnetic resonance according to the preceding claim, wherein a one-dimensional Fourier transformation is used.

3. Imaging method for nuclear magnetic resonance according to one of the preceding claims, wherein the additional field is described by surface-filling or space-filling curves, there being a biunique correlation between field strength values and point of the grating for these curves.

4. Imaging method for nuclear magnetic resonance according to one of the preceding claims, wherein several areas of the sample are measured at the same time.

5. Imaging method for nuclear magnetic resonance according to one of the preceding claims, wherein echoes are generated.

6. Imaging method for nuclear magnetic resonance according to the preceding claim, wherein the additional field changes its sign over time for generating the echo.

7. Imaging method for nuclear magnetic resonance according to one of the preceding claims, wherein the additional field is described by a Hilbert curve.

8. Imaging method for nuclear magnetic resonance, wherein a spatially detectable transversal magnetization is generated in a sample, the signal is

read out along a fractal space-filling trajectory during the data acquisition phase, and a raw-data matrix is formed and an image is obtained from the raw-data matrix by means of Fourier transformation.

5   9. Imaging method for nuclear magnetic resonance according to the preceding claim, wherein the fractal space-filling trajectory is described by a Hilbert curve.

10. Imaging method for nuclear magnetic resonance according to one of
10   the preceding claims 8 or 9, wherein the data acquisition takes place in segments.

11. Imaging method for nuclear magnetic resonance according to one of the preceding claims, wherein an image coding takes place in three
15   dimensions.

12. Imaging method for nuclear magnetic resonance according to one of the preceding claims, wherein parts of a measuring set-up are moved past the sample or through the sample or segments of the magnetic field(s) are
20   activated successively.

13. Device for executing the method according to one of the claims 1 to 7, comprising a constant static magnetic field acting on a sample, means for generating an additional field that is superimposed upon the static
25   magnetic field and that has, in at least one grating surface within the sample volume, different field strength values at each point of the grating surface, means for generating a high-frequency electromagnetic alternating field whereby the sample is excited, means for reading out the electromagnetic radiation emitted by the excited sample, and means for
30   evaluation and image generation.

14. Device according to claim 13, wherein the means for generating an additional field comprise a micro coil arrangement.

35   15. Device for executing the method according to one of the claims 8 to 12, comprising means for generating a spatially detectable transversal

magnetization in a sample, means for data acquisition of a signal along a fractal space-filling trajectory, means for data evaluation forming a raw-data matrix from the acquired data and obtaining an image from the raw-data matrix by means of Fourier transformation.

5